



Out of the Frying Pan, Into the Flood

*Re-thinking the Impacts
of Disasters to Create
Resilience*

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November 28, 2024

What is Resilience?

resilience

noun

re·sil·ience [ri-'zil-yən\(t\)s](#)

[Synonyms of resilience](#)

1

: the capability of a strained body to recover its size and shape after [deformation](#) caused especially by compressive stress

2

: an ability to recover from or adjust easily to [misfortune](#) or change

Mirriam Webster

What is Resilience?

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noun

re·sil·ience [ri-'zil-yən\(t\)s](#)

[Synonyms of resilience](#)

: an ability to recover from or adjust easily to [misfortune](#) or change
[...or in this case, disasters](#)

Climate Change

Mitigation

- Transitional risk
- Alternate power sources
- EV fleet vehicles
- Solar panels
- Reduce GHGs



Adaptation

- Re-Engineering Infrastructure
- Asset life expectancy
- Re-considering work
- Natural assets
- Water



Resilience

- Survival
- Protection of assets
- Delivery of services
- The new new-normal

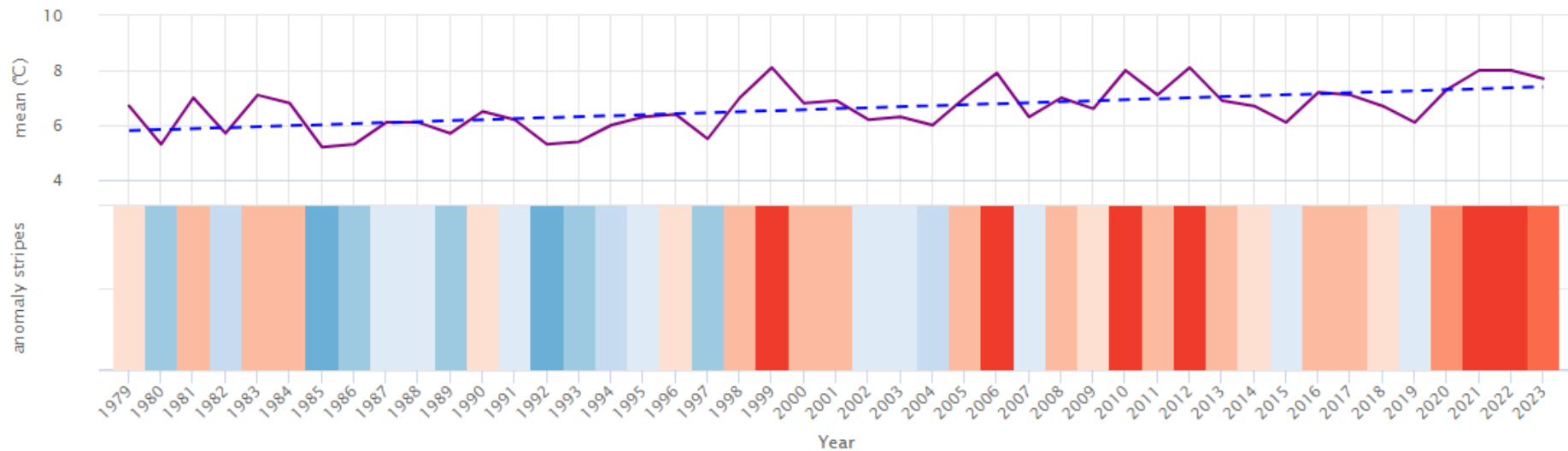
What Climate Change Means to Nova Scotia

- Not just warmer weather – longer growing seasons – more golf!
- Erratic and unpredictable weather and precipitation
- Extreme heat, drought, more convective storms (like Fiona)
- Higher sea level change
- What are the knock-on effects?
- **Crop changes:** pests, invasive species, loss of traditional harvests (with the potential gain for others)
- **Property changes:** dry wells, erosion (loss of property), changes in flood plains, low-lying areas at risk
- **Human resilience:** extreme heat kills, mental health suffers, homeless encampments

Yearly Temperature Change Sydney

Mean yearly temperature, trend and anomaly, 1979–2023.

Sydney 46.14°N, 60.18°W.



Disasters Ev

Lessons Learne

- Learn resilience
- Disaster table-top drills
- Include different stakeholders
- Learn from other occurrences
- Think about interrelated



Cars evacuating on Hammonds Plains Road drive away from the Upper Tantallon wildfire on May 28, 2023.
(George Sadi/CBC)

Under First S

- Respe
- Locatic
- Lack o
- How w



The Butterfly Effect

- Small changes in initial conditions can create significant changes in the final outcome
- Consider invasive species: *Phragmites Australis*
- Importance to wetlands
- Wetlands are important mitigators of flood
- *Phragmites* often grows in ditches



Fort McMurray 2016

Was it Just a Fire?

- Approximately 9 billion in insured losses
- The impacts were widespread: mental health, economic, oil output
- Nationwide insurance impacts (everyone contributes)
- Rash of bankruptcies, both personal and commercial
- Environmental impacts?
- August 2016 Flood

"We're saying this is an underestimation of the actual cost."

'It's just not our year,' city councillor says after flooding damages homes that escaped wildfire

[Zoe Todd](#) - CBC News - Posted: Aug 01, 2016 8:00 AM EDT | Last Updated: August 1, 2016



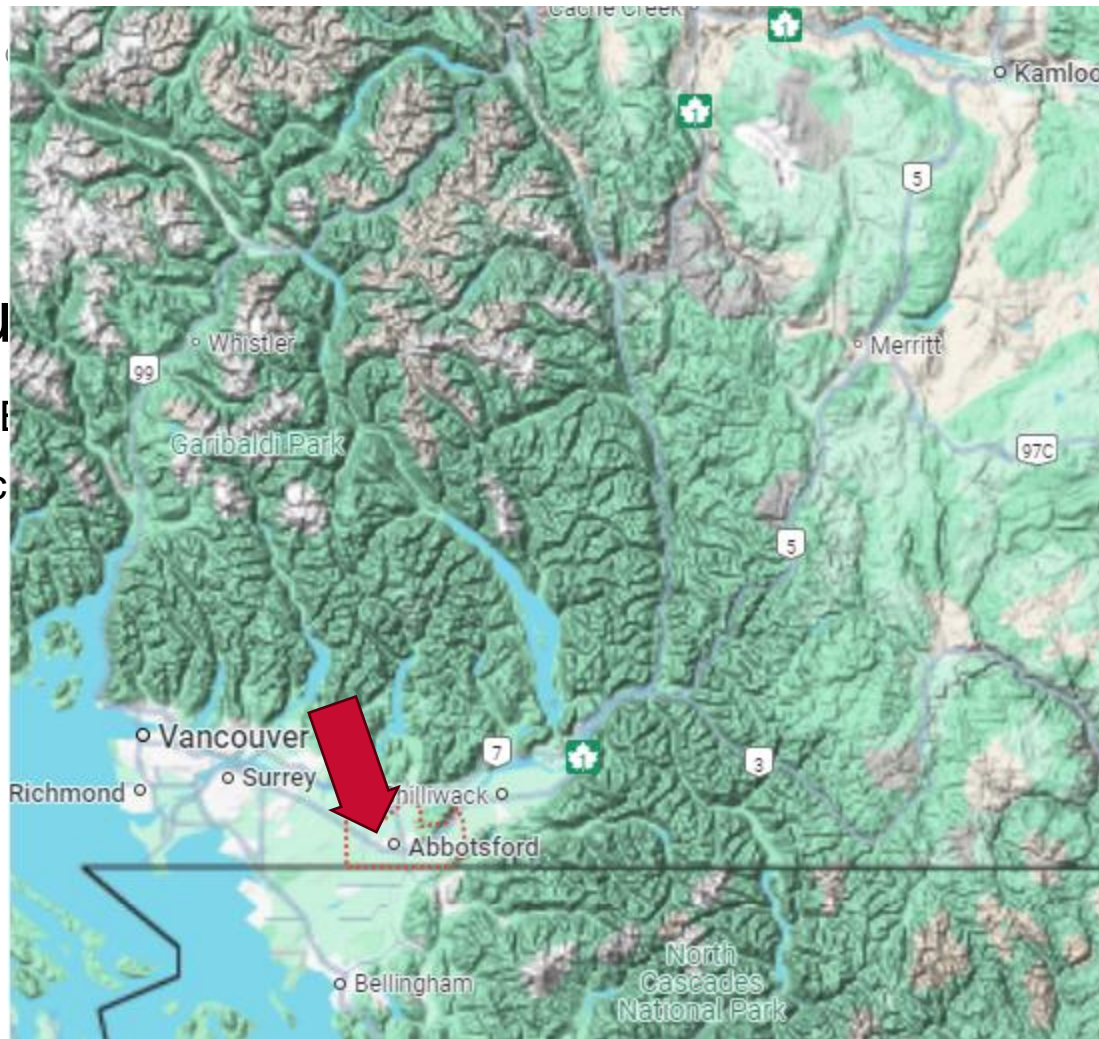
Torrential downpours flooded areas of Fort McMurray, Alta., on the weekend, prompting the Regional Municipality of Wood Buffalo to reopen its emergency operations centre. (Derek Walker/Facebook)

(Sylvain Bascaron/CBC Edmonton)

British Columbia

Was it Just a Matter of Time?

- Abbotsford, British Columbia
- Atmospheric Rivers



The Story of Lytton

The Fire,...the Flood?

- The village of Lytton was razed by fire in on June 30, 2021
- Destroyed much of the town and killed two civilians
- The day prior, Lytton had set Canadian temperature records of 49.6 °C (121.3 °F)
- What can we learn from Lytton?
- Atmospheric River caused significant flooding 3 months later...meanwhile, downstream...



British Columbia

Was it ...

- Atmospheric
- The lower ... & its sub ... from the ...
- What can ... we know ...
- Concurr...



Court certifies class-action flooding lawsuit against Abbotsford

Lawsuit alleges damage from atmospheric river was made worse by city pump station not working properly

The Canadian Press - Posted: May 30, 2024 6:58 PM EDT | Last Updated: May 30



B.C.'s Supreme Court has ruled to certify a class-action lawsuit against the City of Abbotsford for damages and injuries caused by the November 2021 atmospheric river flooding in the Fraser Valley. (Ben Nelms/CBC)

Enough Doom & Gloom!

Nature Can Help!

- Proven efficacy
- Wetlands
- “rainscaping”
- Massive co-benefits
 - Carbon sink
 - Water filtration and storage
 - Ecosystems
 - Tourism
 - New municipal asset



THREE S HOME FL

Step 1: Maintain what you've got at

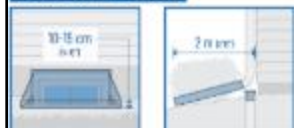
Do-it-yourself, \$0



- 1 Remove debris from eaves, gutters and downspouts.
- 2 Clean out eaves, troughs, roof surfaces, decks and balconies.

Step 2: Complete simple upgrades

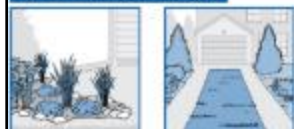
Do-it-yourself, for under \$250



- 1 Install window wells that are 10-15 cm above ground, and install well covers (where fire escape requirements permit).
- 2 Disconnect downspouts, cap foundation drains and extend downspouts and caps to discharge pipes to direct water at least 2 m from foundation.

Step 3: Complete more complex up

Work with a contractor, for over \$250



- 1 Install a rain garden to collect stormwater (at least 5 m from the foundation).
- 2 Convert paved areas to vegetation which absorbs and slows water and less heat.

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ON CLIMATE ADAPTATION

THREE FEATU

Step 1: Maintain what you've

Do-it-yourself, \$0 - \$300



- 1 Remove needles, leaves and other debris from gutters, roof surfaces, decks and balconies. Regularly clean vents.
- 2 Remove all comb ground cover (no plants) within 1.5 m house perimeter.

Step 2: Complete simple upg

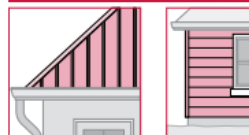
\$300 - \$3,000



- 1 Replace worn or missing weather stripping on all doors including garage doors.
- 2 Add a non-comb 3 mm screen to external vents, dryer vents.

Step 3: Complete more comp

Work with a contractor, \$3,000 - \$30,000



- 1 Install Class A fire-resistant roof covering (e.g. cement fibre, metal or asphalt shingles).
- 2 Install non-comb siding (stucco, stone, cement fibre).

Note: not all actions will be applicable to each home. Consult a professional for more information.

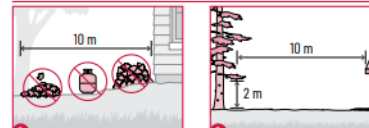
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THREE FEATU WILDFIRE-READ

Communities can integrate wildfire-ready features into their risk management and emergency preparedness. By working with Provincial/Territorial wildfire agencies, available tools, training, and resources to help them assess their unique risks, and

Feature 1: Wildfire-Ready Structures & Infrastruct



- 1 Complete regular maintenance of structures, infrastructure, and landscaping within 10 m to limit accumulation of flammable materials (e.g. leaves, brush piles, stored items, fuel tanks).
- 2 Install/replace landscaping with fire resistant materials within 10 m of structures and infrastructure.

Feature 2: Wildfire-Ready Community Design



- 1 Integrate minimum 30 m wide zones (fire breaks) featuring ignition resistant materials (e.g. mowed grasses, ponds, roads) into community design to limit the spread of fire. Increase minimum to 50 m on steep slopes.
- 2 Provide greater spatial separation between structures in hazard areas to limit the spread of fire from one structure to another.

Feature 3: Wildfire-Ready Emergency Response



- 1 Complete annual emergency planning and cross-training exercises that include multiple agencies (e.g. wildland and structural firefighters).
- 2 Designate at least one emergency shelter per community.

Note: The guidance in this document is voluntary. Completion of actions should not conflict with applicable building and fire codes. Wildfire-ready communities can reduce but not eliminate risk.

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Scan this for additional resources at www.intactcentre.ca

THREE WAYS TO REDUCE CLIMATE RISK WORKING WITH NATURE AT HOME

HEAT AND FLOOD PROTECTION For areas not at risk of wildfire

Complete simple upgrades

Do-it-yourself, for under \$250



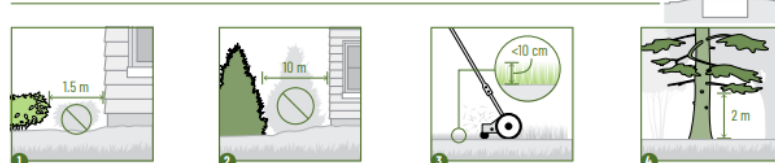
Complete more complex upgrades

Work with a contractor, for over \$250



Note: Seek local advice on appropriate native species that will tolerate future climate conditions, and, in places at risk of wildfire, consider the FireSmart™ guidance below.

WILDFIRE PROTECTION For areas at risk of wildfire



Note: Not all actions will be applicable to each home. Completing these steps does not guarantee the prevention of fire.

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Scan the code or click the link for additional resources at www.intactcentre.ca

UNIVERSITY OF
WATERLOO

Municipal Climate Resiliency Grants

Deadline to submit your application is January 31, 2025

Intact is doubling down and investing \$2 million to support practical solutions that will help municipalities address extreme weather events, including floods and wildfires. Each project will be allocated a maximum of \$200,000.

Check-out the webinar series to help with your grant application.



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